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ROY F. WESTON, INC.

REVISED
PHASE II
SITE ASSESSMENT WORK PLAN
DOWNERS GROVE GROUNDWATER INVESTIGATION
DOWNERS GROVE, ILLINOIS

WESTON®
DESIGNERS/CONSULTANTS

REVISED
PHASE II
SITE ASSESSMENT WORK PLAN
DOWNERS GROVE GROUNDWATER INVESTIGATION
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April 2002

Prepared for

U.S. Environmental Protection Agency
Emergency and Remedial Response Branch
Region V
77 West Jackson Boulevard
Chicago, Illinois 60604

REVISED
PHASE II
SITE ASSESSMENT WORK PLAN
DOWNERS GROVE GROUNDWATER INVESTIGATION
DOWNERS GROVE, ILLINOIS

TDD No. 0111-010
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April 2002

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SECTION 1
INTRODUCTION

1.1 PURPOSE AND ORGANIZATION

1.1.1 Purpose

On 7 January 2002, U.S. Environmental Protection Agency (U.S. EPA) Region V On-Scene Coordinator (OSC) Mr. Steve Faryan under TDD No. 0111-010 directed the Roy F. Weston, Inc. (WESTON®) Superfund Technical Assessment and Response Team (START) to develop a Site Assessment Work Plan prior to initiating a Site Assessment for the Downers Grove Groundwater Investigation in Downers Grove, Illinois. The purpose of this Work Plan is to define the geologic investigation and sampling activities to be performed in order to provide more accurate data for evaluating the source of and potentially responsible parties (PRPs) for the chlorinated solvent groundwater contamination in the Downers Grove area.

1.1.2 Work Plan Organization

This Site Assessment Work Plan is divided into five sections including the following:

Section 1 – The remainder of this section presents an overview of the site background and history.

Section 2 – The scope of services section presents the planned project activities and provides the rationale and the sample-collection procedures that will be performed through the implementation of the Site Assessment Work Plan.

Section 3 – The project team organization documents the responsibility and authority of the organizations and key personnel involved with the implementation of the Site Assessment Work Plan and provides a description of the key personnel directing the Site Assessment.

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Section 4 – The project schedule provides a schedule for Site Assessment activities.

1.2 SITE DESCRIPTION

The Downers Grove Groundwater Site is located in unincorporated Downers Grove, DuPage County, Illinois. The site encompasses the area in which chlorinated-solvent groundwater contamination has been detected in groundwater as shown in Figure 1-1. The approximate boundaries of the site are Burlington Avenue to the north, 63rd Street to the south, Lee and Springside Avenues to the east, and Interstate 355 (I-355) to the west. The site consists of residential, recreational, and commercial/light industry. The Ellsworth Industrial Park is located in the northern portion of the site, and it is within this area that the source of the groundwater contamination is suspected. The Ellsworth Industrial Park is bordered on the north by Burlington Avenue; on the south by Elmore and Inverness Avenues; on the east by Belmont Avenue; and on the west by I-355. Figure 1-1 shows the industrial park based on a recent aerial photograph.

1.3 SITE BACKGROUND

1.3.1 Site Background/History

On 11 October 2001, U.S. EPA received a request from the Illinois Environmental Protection Agency (IEPA) to assign the appropriate personnel to conduct a time-critical removal assessment and possible removal action at the Downers Grove Groundwater Investigation Site located in unincorporated Downers Grove, DuPage County, Illinois.

Between spring and fall 2001, IEPA performed a groundwater investigation just east of I-355 near Downers Grove. The investigation was in response to citizen concerns related to recent private well sampling in neighboring Lisle. The investigation consisted of three rounds of groundwater sampling throughout the area. Approximately 495 private wells were sampled and analyzed for levels of volatile organic chemicals (VOCs). Sample results indicated elevated levels of tetrachlorethylene (PCE), trichloroethylene (TCE), and other related VOCs. Approximately 52% of samples collected

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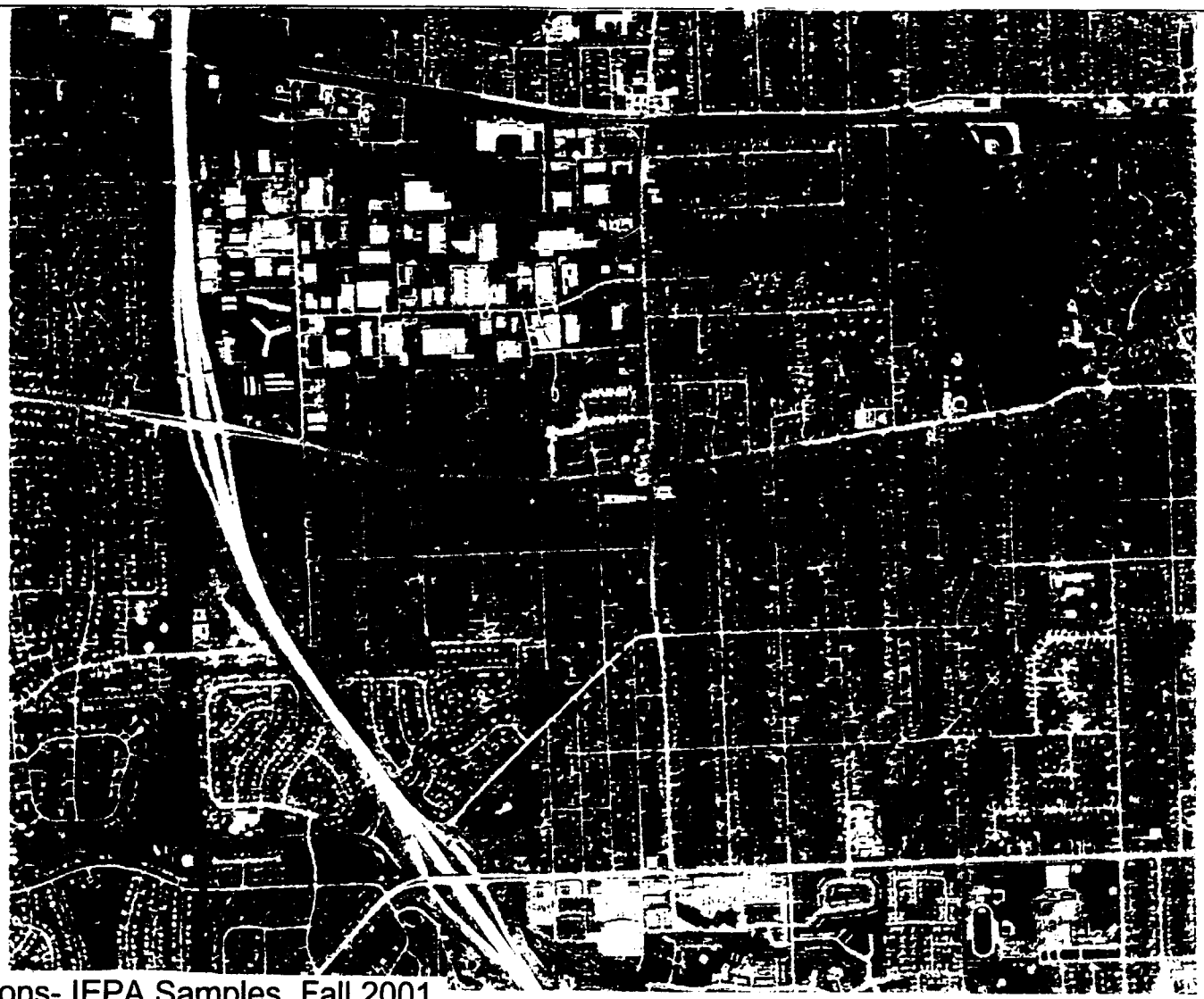

LEGEND

TCE Conc. (PPB)

- 0 - 1.67
- 1.67 - 4.13
- 4.13 - 7.77
- 7.77 - 16.6

N
W E
S

TCE Concentrations- IEPA Samples, Fall 2001

0 0.7 1.4 Miles

NOTE:
FIGURE ADAPTED FROM U.S. EPA FIGURE.

FIGURE 1-1

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM U.S. EPA CONTRACT No. 68-W-00-119 TDD No. S05-0111-010 DOCUMENT CONTROL No. 195-2A-	PROJECT AREA BASE MAP U.S. EPA Downers Grove, Illinois

during Round 1 and Round 2 contained PCE or TCE above 5 parts per billion (ppb) (the federal drinking-water standards and the State of Illinois Maximum Contamination Limit [MCL]), and approximately 7% of the samples collected during Round 3 contained PCE or TCE levels above 5 ppb.

In October 2001, Parsons Engineering Science, Inc. (Parsons) performed a cone penetration testing (CPT) investigation within the Ellsworth Industrial Park under contract to the IEPA. The investigation used a CPT rig to log the shallow lithology in the area and collect groundwater samples at a variety of depths above the bedrock in order to evaluate the potential source(s) of the chlorinated-solvent releases. The area of investigation included only the southern and southeastern-most portions of the industrial park along portions of Wisconsin, Elmore, and Inverness Avenues. During the investigation, Parsons was able to collect three groundwater samples from two boring locations using the CPT sampler. Difficulties were encountered due to low groundwater inflow rates, which the tight clay soil found in the area of investigation likely caused. In the areas where the CPT sampler could not be used, temporary 3/4-inch polyvinyl chloride (PVC) piezometers were installed to facilitate groundwater sample collection. The piezometers were screened over intervals ranging from approximately 20 to 35 ft. A total of 28 groundwater samples were collected from 27 separate sampling locations within the industrial park. Of the 28 groundwater samples, only one sample (CPT-07, from 74.7 - 72.9 feet below ground surface) contained TCE above the method detection limit.

In February 2002, START performed an expanded CPT investigation within the Ellsworth Industrial Park for U.S. EPA. START used the CPT technology to advance additional borings throughout the industrial park and selected areas east of the park. The CPT rig was used to advance stratigraphy borings, which defined the geology at each location as well as identified the presence of water-bearing zones through the unconsolidated overburden formations. Each CPT boring was advanced to refusal, which ranged from 12.14 ft to 79.89 ft. A total of 35 locations were advanced using the CPT rig. Once water-bearing zones were identified, depth intervals were selected for groundwater

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sampling. Similar to the previous CPT investigation, groundwater samples were collected using a combination of CPT downhole samplers or temporary 3/4-inch piezometers. A total of 31 groundwater samples and 14 quality assurance quality control (QA/QC) samples were collected. To monitor for the potential presence of soil gas vapors, a photo- or flame-ionization detector (PID/FID) was used to collect readings just below the borehole surface after retraction of CPT tools and prior to borehole grouting.

Concurrent with U.S. EPA CPT investigation activities, the IEPA conducted additional geoprobe sampling activities at selected locations within the industrial park. These activities consisted of using a geoprobe unit outfitted with a membrane interface probe (MIP) for soil logging and sample collection.

The results of the above-described investigations are summarized in a Draft Preliminary Investigation Report (WESTON, March 2002). The draft groundwater analytical results of the CPT and geoprobe investigation are shown on Figure 1-2.

1.3.2 Phase II Site Assessment Area

Based on the results of groundwater analytical data gathered during the two agency-sponsored investigations (IEPA and U.S. EPA), as well as data from existing monitoring wells installed within the industrial park by others for various purposes, the Phase II Site Assessment will focus on the following properties initially:

- Former Ames Supply Company.
- Arrow Gear, Inc.
- Precision (former DuPage Manufacturing).
- Rexnord, Inc. (two facilities).
- Scot, Inc.
- Areas near former wastewater treatment lagoons.

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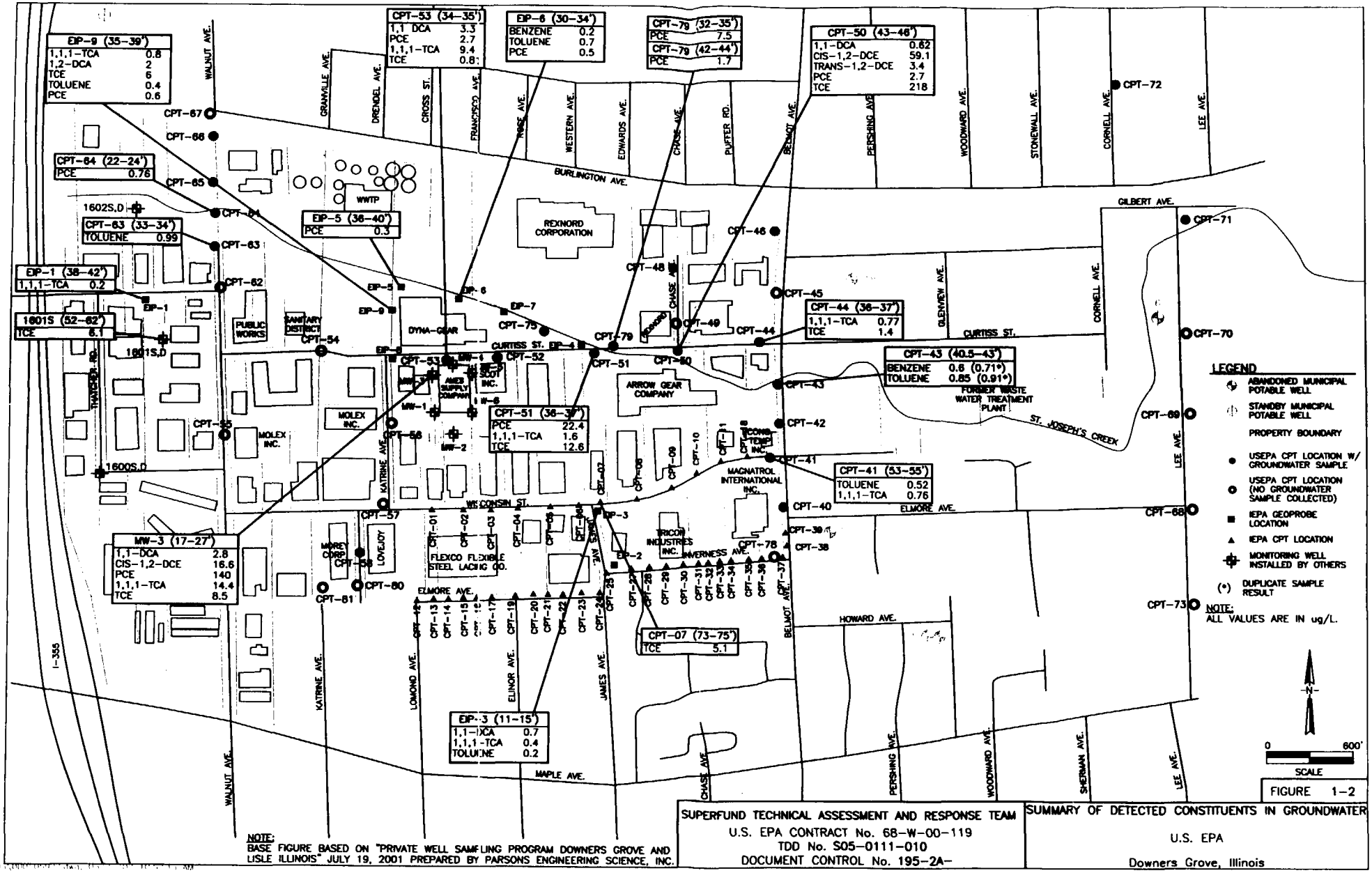
EIP-9 (35-39')
1,1,1-TCA 0.8
1,2-DCA 2
TCE 6
TOLUENE 0.4
PCE 0.6
CPT-53 (34-35')
1,1 DCA 3.3
PCE 2.7
1,1,1-TCA 9.4
TCE 0.8
EIP-6 (30-34')
BENZENE 0.2
TOLUENE 0.7
PCE 0.5
CPT-79 (32-35')
PCE 7.5
CPT-79 (42-44')
PCE 1.7
CPT-50 (43-46')
1,1-DCA 0.62
CIS-1,2-DCE 59.1
TRANS-1,2-DCE 3.4
PCE 2.7
TCE 218
CPT-64 (22-24')
PCE 0.76
CPT-63 (33-34')
TOLUENE 0.99
EIP-5 (36-40')
PCE 0.3
EIP-1 (38-42')
1,1,1-TCA 0.2
1601S (52-62')
TCE 6.1
CPT-44 (36-37')
1,1,1-TCA 0.77
TCE 1.4
CPT-43 (40.5-43')
BENZENE 0.6 (0.71*)
TOLUENE 0.85 (0.91*)
CPT-51 (36-37')
PCE 22.4
1,1,1-TCA 1.6
TCE 12.6
CPT-41 (53-55')
TOLUENE 0.52
1,1,1-TCA 0.76
MW-3 (17-27')
1,1-DCA 2.8
CIS-1,2-DCE 16.6
PCE 140
1,1,1-TCA 14.4
TCE 8.5
CPT-07 (73-75')
TCE 5.1
EIP-3 (11-15')
1,1-DCA 0.7
1,1,1-TCA 0.4
TOLUENE 0.2
WALNUT AVE.
GRANVILLE AVE.
DREXEL AVE.
CROSS ST.
FRANCISCO AVE.
ROSE AVE.
WESTERN AVE.
EDWARDS AVE.
CHASE AVE.
PUFFER RD.
BELMOT AVE.
PERSHING AVE.
WOODWARD AVE.
STONEWALL AVE.
CORNELL AVE.
LEE AVE.
BURLINGTON AVE.
GILBERT AVE.
GLENVIEW AVE.
CURTISS ST.
WWTP
REXNORD CORPORATION
DYNA-GEAR
PUBLIC WORKS
SANITARY DISTRICT
AMES SUPPLY COMPANY
SCOTT INC.
ARROW GEAR COMPANY
FORMER WASTE WATER TREATMENT PLANT
ST. JOSEPH'S CREEK
MOLEX INC.
MAGNATROL INTERNATIONAL INC.
CONS-TECH INC.
TRICON INDUSTRIES INC.
MOREY CORP.
LOVEJOY
FLEXCO FLEXIBLE STEEL LACING CO.
WISCONSIN ST.
ELMORE AVE.
INVERNESS AVE.
HOWARD AVE.
MAPLE AVE.
KATRINE AVE.
LOMOND AVE.
ELINOR AVE.
JAMES AVE.
CHASE AVE.
SHERMAN AVE.
THATCHER RD.
I-355
1602S,D
1601S,D
1600S,D
CPT-66
CPT-67
CPT-65
CPT-64
CPT-63
CPT-62
CPT-55
CPT-54
CPT-53
CPT-52
CPT-51
CPT-50
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CPT-03
CPT-02
CPT-01
CPT-56
CPT-57
CPT-58
CPT-59
CPT-60
CPT-61
CPT-68
CPT-69
CPT-70
CPT-71
CPT-72
CPT-73
CPT-75
CPT-78
CPT-79
EIP-1
EIP-2
EIP-3
EIP-4
EIP-5
EIP-6
EIP-7
EIP-8
EIP-9
MW-1
MW-2
MW-3
MW-4
MW-5
MW-6
LEGEND
ABANDONED MUNICIPAL POTABLE WELL
STANDBY MUNICIPAL POTABLE WELL
PROPERTY BOUNDARY
USEPA CPT LOCATION W/ GROUNDWATER SAMPLE
USEPA CPT LOCATION (NO GROUNDWATER SAMPLE COLLECTED)
IEPA GEOPROBE LOCATION
IEPA CPT LOCATION
MONITORING WELL INSTALLED BY OTHERS
(*) DUPLICATE SAMPLE RESULT
NOTE:
ALL VALUES ARE IN ug/L.
N
0
600'
SCALE
FIGURE 1-2
NOTE:
BASE FIGURE BASED ON "PRIVATE WELL SAMPLING PROGRAM DOWNERS GROVE AND LISLE ILLINOIS" JULY 19, 2001 PREPARED BY PARSONS ENGINEERING SCIENCE, INC.
SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM
U.S. EPA CONTRACT No. 68-W-00-119
TDD No. S05-0111-010
DOCUMENT CONTROL No. 195-2A-
SUMMARY OF DETECTED CONSTITUENTS IN GROUNDWATER
U.S. EPA
Downers Grove, Illinois

As additional information becomes available, the scope of work may be modified by U.S. EPA to include other properties and/or areas to aid in defining the source(s) of chlorinated solvent groundwater contamination in the Ellsworth Industrial Park, Downers Grove, Illinois.

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SECTION 2

DEVELOPMENT OF WORK PLAN

2.1 INTRODUCTION

This Phase II Site Assessment (SA) Work Plan (Work Plan) has been prepared based on the available background information, results of CPT investigations, Geoprobe® investigations, and discussions with U.S. EPA and IEPA.

The Work Plan includes site-specific background information, site-specific project plans, results of recent START field investigation, appropriate U.S. EPA guidance, and technical direction provided by the U.S. EPA OSC. The Work Plan includes the following:

- Identification of SA elements and associated tasking - This includes reviewing site documentation, previous field sampling, and analysis activities. Output of this task will be a detailed work through breakdown structure (WBS).
- Technical Approach - The technical approach includes a description of each task; the technical approach for performing each task and assumptions used; any information to be produced during and at the conclusion of each task; and a description of the deliverables to be produced.
- Schedule - The schedule includes dates for completion of each required task and major submittals identified in various tasks and their due dates. The schedule also includes information regarding timing, initiation, and completion of critical-path milestones.
- Project Staff - The project staff section includes the proposed personnel that will complete the activities defined for each task based on their qualifications and experience.

START will revise and submit the revised Work Plan to incorporate U.S. EPA's comments into the final Work Plan, if necessary. This Work Plan has been prepared based on the available information at the time of preparation.

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2.2 EVALUATION OF EXISTING INFORMATION AND CONTINUING FACILITY REVIEW

2.2.1 Evaluation of Existing Information

In October 2001, IEPA sent out information-request letters to approximately 21 facilities that had been identified during their initial door-to-door survey of the Ellsworth Industrial Park in Downers Grove, Illinois, as using chlorinated cleaners/solvents or other types of chlorinated materials. The information IEPA requested pertained to the site activities related to the purchasing, receiving, processing, storing, treating, disposing, or otherwise handling hazardous substances. START reviewed this information along with available records from the U.S. EPA Records Center in order to develop a list of facilities in the industrial park identified as using chlorinated solvents. Based on the available information, each facility was then ranked according to its potential to be the source of contamination in the Downers Grove area. START initially identified approximately 12 facilities as having a high potential for contributing to the sources of the PCE/TCE contamination. These facilities and supporting information are summarized in the table included in Attachment 1. The facilities are identified on Figure 2-1. This review and identification of potential-source facilities provided the basis for sample-location selection within the industrial park. The information for the facilities is provided in the Work Plan prepared for the preliminary investigation and in the Site Assessment Report prepared for the initial assessment. There were several facilities in which no or limited information was available to review. Therefore, there may be additional facilities that are identified as potential sources of PCE/TCE contamination upon receipt of additional information.

2.2.2 Continuing Facility Reviews

In order to obtain additional information, U.S. EPA sent additional 104(e) questionnaires to each of the facilities identified as using chlorinated solvents within the Ellsworth Industrial Park. For facilities where little or no existing information was known, a standard 104(e) form was sent. For facilities where some historical information was known, a focused 104(e) was sent. U.S. EPA has received responses to the 104(e) questionnaires, which are currently under review by U.S. EPA.

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FIGURE 2-1

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM U.S. EPA CONTRACT No. 68-W-00-119 TDD No. S05-0111-010 DOCUMENT CONTROL No. 195-2A-	INVESTIGATION AREA LOCATION MAP U.S. EPA Downers Grove, Illinois

2.3 PREPARATION OF SITE-SPECIFIC PLANS

Site-specific planning documents developed for previous field investigation activities include the following:

- Health and Safety Plan;
- Sampling and Analysis Plan.

2.3.1 Health and Safety Plan

In accordance with Occupational Health and Safety Administration (OSHA) guidelines and WESTON corporate health and safety policy, a site-specific Health and Safety Plan (HASP) is required for all field tasks. The HASP specifies employee training, protective equipment, medical- surveillance requirements, standard operating procedures, and a contingency plan in accordance with 29 Code of Federal Regulations (CFR) 1910.120.

The HASP prepared for the Phase I Site Assessment will be updated to include the activities outlined in this Work Plan.

2.3.2 Sampling and Analysis Plan

A Sampling and Analysis Plan (SAP) will be prepared to address the field-investigation activities outlined in this Work Plan. The SAP will define the sampling and data-collection methods that will be used for the project. The SAP will include sampling objectives; sampling locations and frequency; and a breakdown of the samples that the laboratory will analyze. The SAP will consider the use of all existing data and will justify the need for additional data whenever existing data will meet the same objective.

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2.4 FIELD INVESTIGATION

This SA is being done to identify the potential source(s) that may be contributing to chlorinated solvent groundwater contamination in Downers Grove residential wells. The Phase II field investigation was designed based on the results of previous field investigations and available background information for the facilities in the industrial park. Field investigation activities are focused near facilities and/or areas identified based on the presence of chlorinated solvents such as PCE/TCE (including their breakdown products), 1,1,1-TCA, etc.; and the results of U.S. EPA's draft historical areal photographic analysis. The photographic analysis identified historic areas of environmental concern such as stained soil, disposal areas, drum storage areas, and the historical surface water drainage patterns. This combination of current groundwater analytical data and historical features were used to determine proposed sample locations for Phase II. Existing sewer lines were also considered in sample location selection.

The investigation will include a shallow soil investigation using Geoprobe, a deep soil investigation using standard drilling and sampling techniques, shallow monitoring-well installations in the glacial deposits, installation of deep monitoring wells in the upper portion of the bedrock, and sediment sampling in St. Joseph Creek. The soil and groundwater samples collected during the investigation will be analyzed for VOCs. Additional parameters (e.g., SVOCs, metals, etc.) may be considered for laboratory analysis on a site-by-site basis, as determined by the U.S. EPA; however, costs are only included for VOCs at this time. The placement of the proposed soil borings and monitoring wells are presented in Figure 2-2, which is based on the 1998 aerial photograph of the site. A summary of the rationale for sample locations is presented in Table 2-1.

The method for each field activity is outlined below in detail. For nested monitoring wells, identification 'S' will be used for shallow monitoring wells installed in the glacial deposits up to a depth of approximately 35 feet bgs; 'I' will be used for the intermediate monitoring wells in the

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N

0 500 Feet

Figure 2-2

WESTON

750 E. Bunker Ct. Ste. 500
Vernon Hills, Illinois
60061-1450

Sample Location Map Based On 1998 Orthophoto
U.S. EPA START
Downers Grove, Illinois

Legend

- △ Sediment
- ● Soil Borings
- ○ Geoprobes
- ● Nested Wells (Overburden & Bedrock)
- ◐ Overburden Wells

Table 2-1

Rationale for Sampling Location
Ellsworth Industrial Park
Downers Grove, Illinois

Sampling Location	Rationale
Former Ames Supply	Borings and well installations are proposed to evaluate previously detected VOC contamination in groundwater on this property.
Arrow Gear	These borings and well installations are proposed to evaluate potential subsurface contamination on the property occupied by Arrow Gear and are based on historical aerial photo analysis and groundwater flow directions.
Dynagear	One geoprobe boring location is proposed to evaluate a potential VOC detection during the initial SA IEPA Geoprobe investigation
Lindy Corporation	Borings and well installation to evaluate potential subsurface contamination on property, near west extent of suspected surface area at facility with historic degreaser and cleaning operations.
Precision	These borings and well installations are proposed to evaluate potential subsurface contamination on the property occupied by Precision.
Rexnord	These borings and well installations are proposed to evaluate potential subsurface contamination on the Rexnord Corporation and are based on historical aerial photo analysis and groundwater flow directions.
Scot, Inc	These borings and well installations are included to evaluate potential contamination in the former underground storage tank (UST) area.
WWTP	Borings and well installations are proposed to evaluate former impoundments/lagoons and sludge drying bed areas.
Burlington Ave.	Monitoring wells designed to evaluate upgradient groundwater quality with respect to the industrial park.

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Sampling Location	Rationale
Wisconsin Ave.	Monitoring wells designed to evaluate downgradient groundwater quality with respect to potential source areas.
Sediment Samples	The sediment samples will be collected to evaluate if the industrial park has contaminated the St. Joseph Creek and also to evaluate if the Creek is a potential source.

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glacial deposits between approximately 40 feet bgs and the bedrock surface; and 'D' will be used for the bedrock monitoring wells. For example; if a well nest with three wells will be installed at monitoring-well location RFW-1, the shallow monitoring well will be identified as RFW-1S; the intermediate monitoring well will be identified as RFW-1I; and the bedrock monitoring well will be identified as RFW-1D.

2.4.1 Geoprobe Investigation

The IEPA will perform the Geoprobe investigation; therefore, no WESTON START effort has been included for the Geoprobe investigation. WESTON START will take custody and ship the samples IEPA collects to the WESTON START procured laboratory for analysis, if requested by the IEPA and approved by the U.S. EPA. In addition, the Geoprobe rig will be outfitted with a Membrane Interface Probe (MIP), which is capable of monitoring and detecting the presence of total volatile organics as the probe is advanced through the subsurface. This will determine the presence and relative depth of any gross VOC contamination encountered. Penetration depths are anticipated to average 30 to 40 feet bgs based on previous work. Based on the results of MIP logging, selected soil cores may be collected at the IEPA geologists discretion to verify lithology, perform field headspace screening, and collect soil samples for laboratory analysis. If saturated conditions are encountered, grab groundwater samples will also be collected for laboratory analysis to further evaluate the presence of VOCs in groundwater.

2.4.2 Soil-Boring Drilling and Sampling Procedure

Each non-Geoprobe sampling location will start as a soil boring to enable collection of lithologic information, water table conditions, and contaminant screening. Standard 4.25-inch inside diameter (ID) hollow-stem augers (HSA) will be utilized for the soil-boring investigation. This technique was selected due to the presence of very dense clay till materials and boulders/cobbles at depth, which limited penetration depths for direct push equipment and the ability to identify bedrock during

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previous investigations. Bedrock depth is estimated at 60 to 80 feet bgs and is dependent on surface topography and bedrock erosional features, which vary across the site. In some cases, bedrock may be as deep as 100 feet based on ISGS well logs for the area.

Soil borings will be advanced to the bedrock surface, unless terminated early as described below. Continuous samples from the borings will be collected using a decontaminated 2-foot split-spoon sampler and/or CME continuous sampler, if conditions warrant. Following removal from the borehole, the sampler will be opened on a clean surface (e.g., polyethylene sheeting) for logging and analysis by the START on-site geologist. The samplers and associated equipment that come into contact with the soil will be decontaminated prior to use. Before drilling at any locations, the driller will decontaminate the working end of the drill rig, hollow-stem augers, drilling equipment, and tools using a high-pressure steam cleaner at the aforementioned decontamination pad area. The drilling and sampling equipment will be decontaminated according to the procedures outlined in Tables 2-2 and 2-3.

Up to two soil samples may be collected from each soil boring/monitoring well location for laboratory analysis. Head-space screening will be performed on each split-spoon sample collected using a FID/PID (e.g., TVA-1000). In general, the two soil samples showing the presence of the highest levels of VOCs based on head-space screening results will be submitted to the laboratory for VOC analysis. In some cases, the deeper sample location may be collected from a zone which appears to be free of contamination to verify vertical extent. If necessary, additional soil samples may be submitted for VOC analysis depending on the results of head-space screening. The samples will be collected using Encore samplers. Encore samples will be placed on ice immediately following collection of a sample.

Each soil boring is scheduled to be advanced to the bedrock surface; however, drilling and soil sampling at any soil boring location may be discontinued by the on-site geologist if it is determined that significant or gross contamination is evident based on visual, olfactory, and/or headspace

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Table 2-2

Standard Decontamination Protocol for Sampling Equipment
Ellsworth Industrial Park
Downers Grove, Illinois

Step	Procedure
1	Scrub equipment thoroughly with soft-bristle brushes in a phosphate-free, low-sudsing detergent solution.
2	Rinse equipment with tap water by submerging and/or spraying. (See note below).
3	Rinse equipment with reagent-grade distilled/deionized water until dripping and allow to air dry for 1 to 2 minutes.
4	Rinse equipment a second time with deionized water by spraying until dripping.
5	Wipe dry with paper towels.

Note: The decontamination liquids will be managed as described in Section 2.4.10. If sampling equipment was used to collect oily or adhesive types of contaminated media or the presence of organic-compound residue is suspected, a rinse via spraying with isopropanol will be included after Step 2.

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Table 2-3

Standard Decontamination Protocol for Drilling Equipment
Ellsworth Industrial Park
Downers Grove, Illinois

Step	Procedure
1	Move the drilling rig or other equipment/materials to the designated decontamination area at the site.
2	Support all augers and related downhole drilling equipment above ground and individually steam clean.
3	Steam clean the control panel and working area of the drill rig.
4	Place all decontaminated well materials (e.g., well casing, well screen) on clean polypropylene sheeting until use.

Notes: All steam cleaning will be performed using pressurized steam. Steam cleaning will continue until all solid material and/or visible contamination is removed. The decontamination liquid will be managed as described in Section 2.4.10.

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screening. Examples would be heavy visual oil/solvent zones and/or elevated total VOCs based on field screening. This will be done to preclude potential cross contamination of geologic zones during drilling. In these cases, it will be concluded that a potential contaminant source has been identified and drilling will cease. The geologist will also take into account the types and characteristics of the geologic formations present in determining whether to proceed (e.g., presence/absence of clay confining layers, etc.).

Soil borings will be abandoned upon completion by filling the annulus with a cement bentonite grout from the bottom up as the augers are withdrawn. This will ensure an adequate seal throughout the soil column.

2.4.3 Monitoring Well Installation Procedures

The shallow and bedrock monitoring wells will be installed at locations shown in Figure 2-2. Each monitoring well location will be drilled, sampled, and evaluated as described in Subsection 2.4.2 soil boring procedures. Upon completion of soil boring and sampling activities, hydrogeologic and contaminant screening data gathered from the borehole will be evaluated. Where saturated formations and/or indications of contamination are present in overburden drift materials, monitoring wells will be installed to facilitate collection of discrete groundwater samples and allow measurement of static head elevations.

At some locations more than one overburden monitoring well may be installed based on the hydrogeologic conditions encountered. For example, if two distinct and separate saturated sand layers are encountered, separate monitoring wells may be installed in each to evaluate groundwater chemistry. The depth of each shallow and bedrock monitoring well will be determined by the field geologist in consultation with the WESTON START hydrogeologist.

Overburden monitoring wells will be constructed using the following materials and methods:

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- The monitoring well will be constructed of 2-inch-diameter type 304 stainless steel riser pipe. Well screens will be 5 or 10 feet long and will be constructed of type 304 stainless steel with continuously slotted 0.010-inch openings. The end of the well screen should be covered with an end cap. All couplings/fittings will be flush-thread with no glues or adhesives allowed.

- The annular space around the screen will be filled with a silica sand pack that is allowed to collapse as the augers are pulled out of the ground. The sand pack will extend 2 to 3 feet above the top of the screen.

- After the sand pack is in place, the annular space above the sand pack will be sealed with 2 feet of bentonite pellets or a high-solids pure bentonite grout tremmied in from bottom up. Where bentonite pellets are used, they will by hydrated with potable water and allowed to stand for 15 minutes before construction continues.

- If bentonite pellets are used for the well seal, the remaining annular space around the wells will be backfilled above the seal using tremmied cement/bentonite grout (6 parts cement to 1 part bentonite by volume). Where high-solids pure bentonite grout is used, it will be brought up to within 3 feet of the ground surface.

- An approximate 2-foot-diameter, 4-inch-thick concrete pad will be installed at the ground surface around each of the monitoring wells. The pads will be made of ready-mix concrete and will be sloped away from the well to provide surface-water diversion.

- The riser pipe should stick up above the ground surface about 2.5 feet and be fitted with an expandable locking cap. To provide well protection, each well will be furnished with a locking pro cover that is approximately 3 feet in length. The pro cover will be set in the concrete apron at all monitoring well locations. Locks should be provided. In areas of vehicular traffic or landscaped areas, a flush-mounted surface casing may be installed.

The schematic for the shallow monitoring well is provided in Figure 2-3. The schematic for the bedrock monitoring well is provided in Figure 2-4.

The sampling equipment will be decontaminated in accordance with the procedures outlined in Table 2-2. The drilling equipment will decontaminated in accordance with the procedures outlined in Table 2-3.

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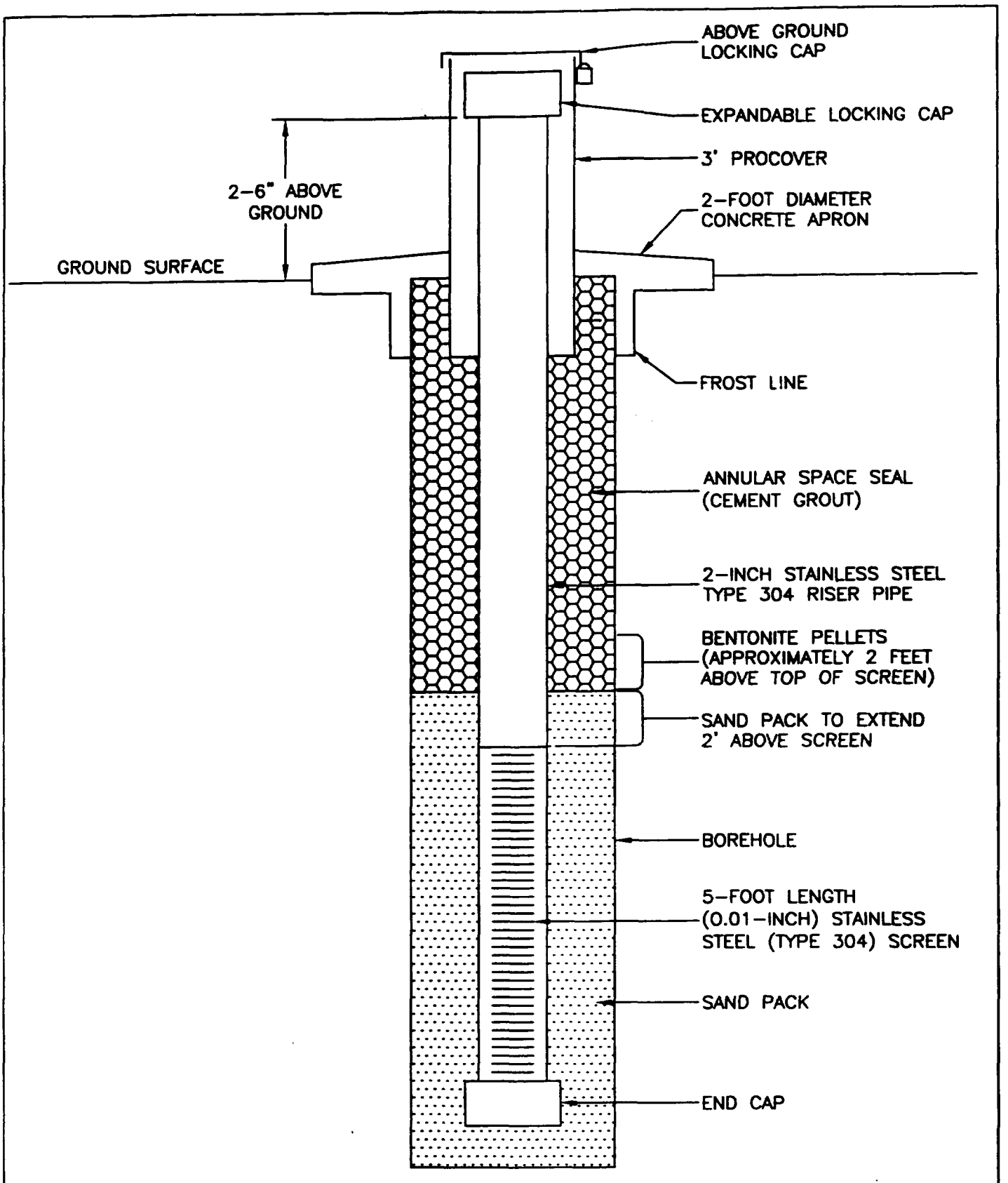
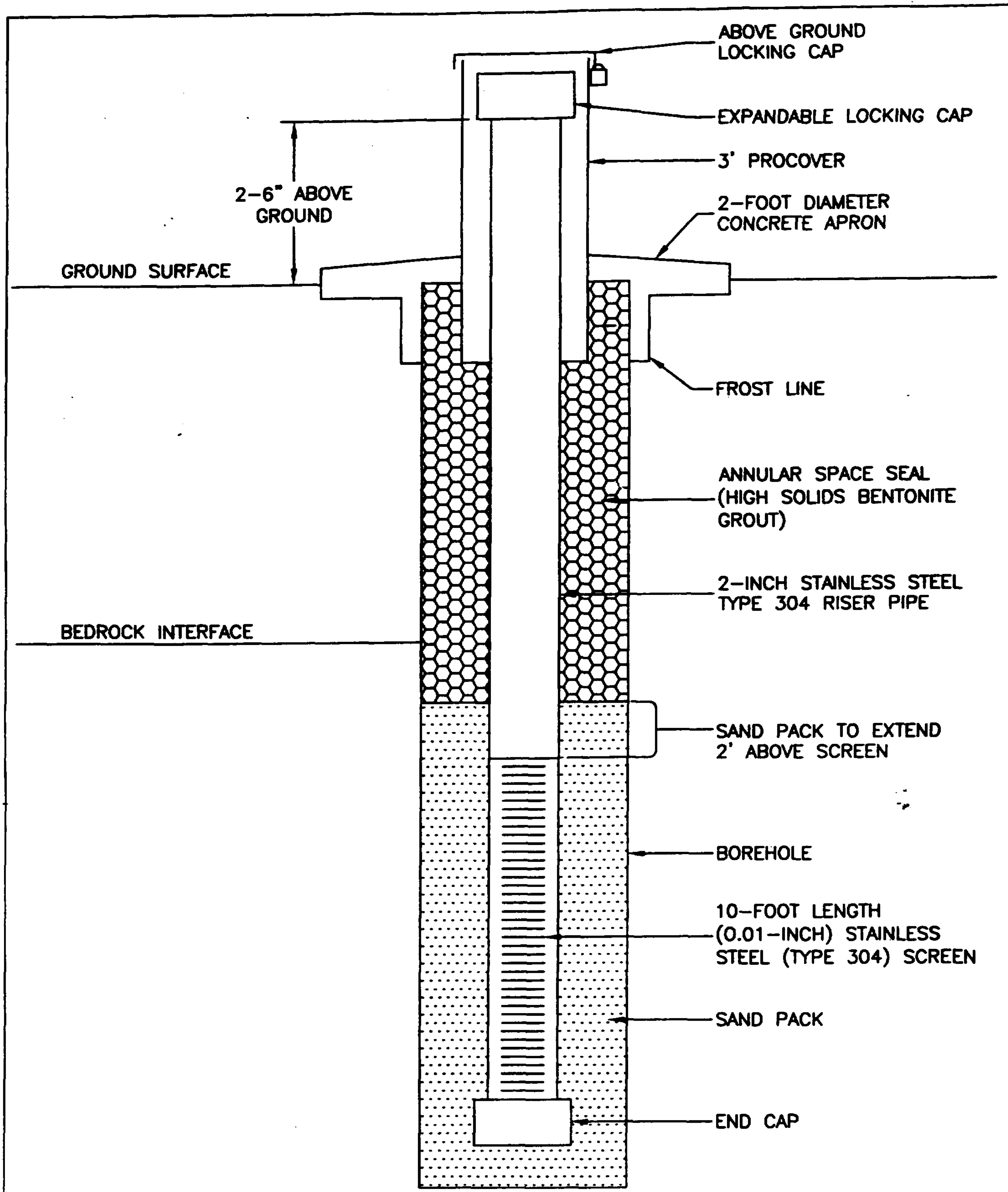


NOT TO SCALE

FIGURE 2-3

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM U.S. EPA CONTRACT No. 68-W-00-119 TDD No. S05-0111-010 DOCUMENT CONTROL No. 195-2A-	SHALLOW MONITORING WELL CONSTRUCTION ELLSWORTH INDUSTRIAL PARK USEPA Downers Grove, Illinois



NOT TO SCALE

FIGURE 2-4

SUPERFUND TECHNICAL ASSESSMENT AND RESPONSE TEAM U.S. EPA CONTRACT No. 68-W-00-119 TDD No. S05-0111-010 DOCUMENT CONTROL No. 195-2A-	BEDROCK MONITORING WELL CONSTRUCTION ELLSWORTH INDUSTRIAL PARK USEPA Downers Grove, Illinois

At locations shown as bedrock monitoring wells (Figure 2-2), nested wells will be installed depending on saturation conditions encountered. The nested wells will include one or two shallow monitoring wells and a bedrock monitoring well (see following subsection).

2.4.4 Bedrock Drilling and Well Installation

At locations where bedrock wells are to be installed, drilling will occur through the overburden using casing advancing techniques such as dual-tube reverse rotary or rotosonic drilling to the bedrock interface. These methods will ensure that potential cross contamination of aquifer zones does not occur during the drilling process. To further preclude the potential for cross contamination, bedrock monitoring wells may be double-cased to seal off the overburden. A minimum 4-inch steel or PVC casing will be advanced one to three feet into the bedrock surface and grouted into place using a cement-bentonite mixture. The grout will be allowed to cure for approximately 24 hours before drilling resumes. The need for double casing will be determined in the field based on headspace screening and field observations.

The bedrock will then be drilled using a 3 7/8-inch tri-cone rotary bit. The depth of rock drilling will be determined by the START Geologist but is expected to be approximately 15 to 20 feet into the bedrock surface. This zone typically represents a weathered and fractured zone capable of groundwater movement. No drilling mud or additives will be used during the rock-coring process. Only water shall be used. Any water lost to the formation during drilling will be recorded such that an equivalent volume can be evacuated during well development. The monitoring well construction and materials will be as described in the Section 2.4.3. All rock-coring equipment and tools will subsequently be decontaminated after each use with a high-pressure steam cleaner at the decontamination pad. The decontamination procedures are outlined in Table 2-3.

Upon completion of monitoring installation, each well will be surveyed for location and elevation. Horizontal location surveying will be conducted by U.S. EPA personnel using survey-grade GPS

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equipment and state plane coordinates. A licensed land surveyor will be subcontracted to survey each well for vertical elevation referenced to a USGS benchmark. The accuracy of vertical elevation data will be +/- 0.01 feet. Elevations will be surveyed at each location for the ground surface and top of well casing.

2.4.5 Monitoring-Well Development Procedure

After installation of monitoring wells, each well will be developed using the following procedure:

- All equipment to be introduced into the well will be decontaminated in accordance with the procedures outlined in Table 2-2.

- New monitoring wells will be developed no sooner than 48 hours after installation.

The well will be developed by alternately surging and purging. The surge and purge cycle will consist of several minutes of surging followed by several minutes of purging to remove material collecting in the bottom of the well. The surging will be accomplished by rapidly moving a weighted bailer or surge block in the screened interval. This will be followed by purging the well using a bailer or pump to remove the suspended sediment.

- A positive displacement pump, bladder pump, or disposable bailer will be used for well development and will be decontaminated in accordance with Table 2-2 before being used in a well. After removing the third well volume, WESTON personnel will measure pH, temperature, and specific conductance. Well development will continue until these readings stabilize for three consecutive readings (± 0.25 units for pH, ±10 percent for specific conductance, and ±1°C for temperature). A minimum of five well volumes will be purged during development.

- If water is added to the bedrock monitoring well during the drilling process, an amount of water equal to any water lost during drilling and rock coring will also be purged during the development process.

- If the well can be purged dry, it will be developed in a manner that limits agitation by slowly purging the well dry. Wells that can be purged dry will not be surged, and

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no water will be added to the well.

Well-development water will be managed in accordance with the requirements outlined in Section 2.4.10.

2.4.6 Groundwater Sampling

The groundwater samples will be collected from newly installed monitoring wells, monitoring wells present on Ames Supply Company, Rexnord production well and municipal well located south of Ames Supply Company. The newly installed monitoring wells and will be sampled no sooner than 48 hours after well development. The groundwater samples will be collected using low-flow sampling techniques. The groundwater will be purged at a rate between 100 and 500 milliliters per minutes (ml/min) until pH, conductivity, temperature, and turbidity have stabilized. The groundwater samples will be collected in laboratory sample containers. Following collection of the groundwater samples, each sample bottle will be checked for presence of air bubbles. The groundwater samples will be preserved and placed on ice immediately following collection of the samples. The samples will analyzed for VOCs using SW 846 Method 8260. Additional parameters (e.g., SVOCs, metals, etc.) may be considered for laboratory analysis on a site-by-site basis, as determined by the U.S. EPA; however, costs are only included for VOCs at this time

2.4.7 Sediment Sampling

The sediment-sample locations have been selected based on information on the outfalls in the St. Joseph Creek gathered by IEPA and U.S. EPA. For this investigation, a limited number of sediment samples are planned to evaluate if the creek is a potential source of groundwater contamination. The sediment sample locations Are shown on Figure 2-2 and correspond to surveyed outfall locations.

Two sediment samples, one each at a depth of 0-6 inches and 6-12 inches, will be collected at each

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location using a hand auger. The sampling will begin from the most downstream location and proceed progressively to the upstream locations. Sediment samples will be collected as near to the midstream or midchannel as possible. Sampling at midstream may be changed in the field due to safety concerns and to minimize sediment disturbance by the sample team walking in the stream. The sample bottles will be completely filled with no head space. The samples will analyzed for VOCs using SW 846 Method 8260. Additional parameters (e.g., SVOCs, metals, etc.) may be considered for laboratory analysis on a site-by-site basis, as determined by the U.S. EPA; however, costs are only included for VOCs at this time

The sampling equipment will be decontaminated between sample locations using the equipment-decontamination procedures outlined in Table 2-2.

2.4.8 Construction of Temporary Decontamination Pad Procedure

The drilling subcontractor will construct a temporary decontamination pad. START will work with the U.S. EPA OSC to find a suitable decontamination pad location within the industrial park. The decontamination pad will be constructed in such a way as to allow the drill rig to back onto it during the decontamination process, as necessary. The pad will contain a curbed edge and be capable of collecting and holding all decontamination fluids derived during the decontamination of drilling equipment. The decontaminated fluid will be transferred into drums or a temporary tank and transferred to a location where the investigation-derived waste (IDW) is stored. The temporary pad will be removed at the completion of the project, and the site will be restored to its original condition.

2.4.9 Decontamination Procedures

All sampling equipment including stainless-steel spoons, spatulas, bowls, split spoons, continuous samplers, and bailers will be decontaminated before used to collect a sample. The decontamination

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procedures are outlined in Table 2-2.

The working end of the drill rig and all downhole and associated drilling equipment, tools, and materials will be decontaminated prior to drilling each new soil boring and monitoring well. Only previously decontaminated equipment will be placed in a boring or well. All drilling-related equipment (except the split-spoon or continuous sampler) will be decontaminated in accordance with the protocols presented in Table 2-3.

The management of water generated during decontamination will be in accordance with the requirement outlined in Section 2.4.10.

2.4.10 Management of Investigative-Derived Waste

All IDW generated during drilling activities will be containerized. This includes soil and waste cuttings, well-development water, steam-cleaning rinsate, and used personal protective equipment (PPE). The IDW will be stored in the U.S. Department of Transportation (DOT)-approved 55-gallon drums.

All IDW drums will be transferred to the temporary drum staging area within the industrial park. START will work with the U.S. EPA OSC to find a suitable location within the industrial park for temporary storage of IDW. Each drum will be marked with the date, drilling location, and contents using a permanent paint marker or affixing a weather-resistant sticker containing the required information to the drum.

WESTON START will initiate disposal of the IDW within two weeks of completion of Phase II Site Assessment.

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2.5 ANALYTICAL PARAMETERS

It is estimated that START will collect approximately 40 groundwater samples during this SA. In addition to these samples QA/QC samples will also be collected. The groundwater samples will be collected from each shallow and deep monitoring-well location. Groundwater samples will be analyzed for VOCs only using U.S. EPA SW-846 Method 8260. START has requested a standard turnaround time of 14 days from the laboratory.

It is estimated that up to 100 soil samples will be collected during this SA. In addition to these samples QA/QC samples, will also be collected. Soil samples will be analyzed for VOCs using U.S. EPA SW-846 Method 8260.

It is estimated that 16 sediment samples will be collected from 8 locations during the SA. In addition to this, QA/QC samples will also be collected. Sediment samples will be analyzed for VOCs using U.S. EPA SW-846 Method 8260.

Additional parameters (e.g., SVOCs, metals, etc.) may be considered for laboratory analysis on a site-by-site basis, as determined by the U.S. EPA; however, costs are only included for VOCs at this time

2.6 FIELD QUALITY-CONTROL SAMPLES

Field duplicates and equipment blank samples will be collected at a frequency of 1 per 10 project samples per parameter. Trip blanks will also be collected at a frequency of one per sample cooler shipment of aqueous VOC samples.

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2.7 ANALYTICAL LABORATORY PROCEDURES

Samples collected for VOC analyses will be analyzed by the analytical laboratory, which will follow the methods specified in SW-846-8260.

2.8 DATA VALIDATION/MANAGEMENT

All laboratory analytical data will be validated by a WESTON Data Validator. The following guidelines for data validation will be utilized:

Laboratory Data Validation Functional Guidelines for Evaluating Organic Analyses– U.S. EPA, October 1999.

Laboratory Data Validation Functional Guidelines for Evaluating Inorganic Analysis - U.S. EPA, February 1994.

2.9 SAMPLE PACKAGING, STORAGE, AND SHIPMENT

Sample containers will be labeled and shipped with a sample tag affixed to each container. Samples will be placed in plastic zipping bags. Bagged containers will be placed in appropriate transport containers, and the containers will be packed with appropriate absorbent material, such as vermiculite, and preserved with ice to 4° Celsius. All sample documents (e.g., chain of custody) will be affixed to the underside of each transport-container lid. The lid will be sealed with shipping tape, and custody seals will be affixed to the transport container. Transport containers will be labeled with the origin and destination locations.

Regulations for packaging, marking, labeling, and shipping hazardous materials and wastes are promulgated by DOT. Air carriers that transport hazardous materials require compliance with the current International Air Transport Association (IATA) Regulations, which apply to the shipment and transport of hazardous materials by air carrier. START will follow IATA regulations to ensure

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compliance.

2.10 SITE HEALTH AND SAFETY

The Site Health and Safety Plan will meet the OSHA requirements of 29 CFR 1910.120. The HASP will be read and signed by each individual from START, WESTON's subcontractors, and all other personnel who will be on-site. Also, START will work with JULIE and local municipalities to have underground utilities surrounding the borings located prior to the start of the scheduled field work.

Marking of underground utilities at Geoprobe locations will be the responsibility of IEPA personnel since Geoprobe activities will not be under the direct control of START.

Elements required by 29 CFR 1910.120 are outlined in the HASP. These elements concern the regulatory status of the site; hazard assessment and equipment selection; source/location of contaminants and hazardous substances; chemical, biological, radiation, and physical hazards of concern; medical surveillance; site hazard monitoring, program; and PPE for employee protection, monitoring, and decontamination. In accordance with WESTON's PPE program and 29 CFR 1910.132, the Site Health and Safety Coordinator (SHSC) and/or the Site Manager have evaluated conditions and verified that the PPE selection outlined in the HASP is appropriate for the hazards known or expected to exist.

2.11 SITE CONTROL MEASURES

Site control measures include a description of the contamination zone, safe-zone boundary, and other requirements of 29 CFR 1910.120. Contamination-zone and safe-zone boundaries are yet to be determined for each of the boring locations and will be delineated prior to conducting sampling activities.

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Personnel and equipment decontamination will be conducted in accordance with START's HASP and standard operating procedures (SOPs) as part of the SAP. Decontamination is performed as a quality-assurance measure and a safety precaution. It prevents cross contamination among samples and helps maintain a clean working environment for the safety of all field personnel. All used PPE materials will be properly contained, bagged, labeled, and left on-site to be disposed of at the discretion of the U.S. EPA.

2.12 SITE PREPARATION

Prior to advancing any borings using the CPT rig, START will work with JULIE to identify any overhead and underground utilities near the such as the following:

1. Electrical lines and appliances
2. Gas lines
3. Pipelines
4. Steam lines
5. Water lines
6. Sewer lines
7. Pressurized air lines
8. Cable television lines
9. Telephone lines

WESTON's SOP Number FLD 34-Utilities is part of the Site-Specific Sampling Plan and/or HASP.

Approximately one week prior to the site assessment, START will work with representatives of the U.S. EPA to flag all of the boring locations. U.S. EPA will identify drilling locations using a global positioning system (GPS) unit.

Some of the industrial facilities where drilling is scheduled to take place have indicated that their company information with regard to underground utilities may be sketchy, unreliable, or little information exists. If requested, and approved by U.S. EPA, a private utility locating contractor may

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be subcontracted by START to locate underground lines in addition to standard locating services using JULIE.

2.13 SITE ASSESSMENT REPORT

START will prepare a Site Assessment Report that accurately establishes the site characteristics such as media contaminated, extent of contamination, and the results of the geologic investigation. START will initially prepare a draft Site Assessment Report, which includes the following:

- Site Background - START will assemble and review available facts about the regional conditions and conditions specific to the site.
- Investigation
  - Field investigation and technical approach
  - Chemical analysis and analytical methods
  - Field methodologies
- Site Characteristics
- Discussion of Investigation Results
- Summary and Conclusions

After the U. S. EPA reviews the draft SA Report, START will incorporate U. S. EPA comments and submit the final SA Report.

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SECTION 3

PROJECT TEAM ORGANIZATION

Operational responsibilities involving execution and direct management of the technical and administrative aspects of this project have been assigned as follows:

U.S. EPA On-Scene Coordinator — Mr. Steve Faryan is the U.S. EPA OSC for this project.

START Program Manager—Mr. Dean Geers is the START Program Manager. The Program Manager has overall responsibility for the work assignment. The Program Manager is responsible for ensuring that the project meets all U.S. EPA objectives and quality standards. He is also responsible for ensuring that all work is executed in accordance with the U.S. EPA's technical directives. The START Program Manager is responsible for assigning and monitoring the functions and responsibilities of the START Project Manager. In addition, he will commit the necessary resources and personnel to meet the objectives of this removal assessment.

START Project Manager—Mr. Omprakash Patel is the Project Manager. The Project Manager is responsible for implementing the project objectives using the personnel assigned. The Project Manager's primary function is to ensure that the technical, financial, and scheduling objectives are achieved successfully. The START Project Manager will coordinate with the START Program Manager and Quality Assurance Manager and will be the major point of contact and control for matters concerning the project. His other responsibilities include the following:

- Coordination and management of project personnel;
- Project scheduling;
- Coordination and review of required deliverables;
- General quality assurance of field activities;
- Representation of the project team at meetings and public hearings;
- Overall responsibility for all audits under the START contract.

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START Technical Lead–Mr. Kurt Fischer will serve as the START Technical Leader and will be responsible for ensuring that the technologies selected for the geologic investigation and groundwater sampling are appropriate for the site conditions. Mr. Fischer will also be responsible for ensuring that boring locations are appropriate based on previous studies and facility-specific information U.S. EPA obtains. The Technical Lead will also provide the initial technical review of all deliverables and data-collection activities.

START Project Leader/Field Team Leader–Mr. Ben Maradkel will serve as the START Project Leader/Field Team Leader and will be responsible for the daily direction of the team members regarding the TDD-specific tasks. The START Project Leader/Field Team Leader will also coordinate site activities with IEPA. In essence, this person will be responsible for the management of the field team and the supervision of all field activities.

START Site Health and Safety Coordinator (SHSC) – Mr. Ben Maradkel will also serve as the individual responsible for implementing the Health and Safety Plan. The SHSC will perform health and safety monitoring and ensure compliance with all health and safety requirements.

START Field Geologist - START will identify an individual to serve as the field geologist for this site assessment. This individual will be responsible for overseeing the CPT contractor and ensuring that geologic information obtained during the investigation is accurate.

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SECTION 4

PROJECT SCHEDULE

4.1 SCHEDULE

The project schedule to implement the scope of work in this Work Plan is outlined below:

Date	Task
2 April 2002	Submit Draft Phase II Work Plan to U.S. EPA for review.
23 April 2002	Submit Final Phase II Work Plan to U.S. EPA
15 April - 19 April 2002	Mobilization. Stake out boring locations and identify utilities, secure property access.
18 April - 31 May 2002	Perform Site Assessment field activities (WESTON START and IEPA).
14 June 2002	Analytical Data Receipt.
28 June 2002	Submit Draft Phase II Site Assessment Report.

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ATTACHMENT 1

BACKGROUND SUPPORTING INFORMATION

HAS BEEN REDACTED

CONTAINS ENFORCEMENT CONFIDENTIAL INFORMATION